

IN THE CLAIMS

1. (Currently amended) A method for preparing organic silicate polymer, comprising:

i) mixing silane compound with organic solvent to form a first mixture, the silane compound being one selected from the group consisting of:

~~a) a siloxane oligomer prepared by oxidizing hydrosilane oligomer represented by the following Chemical Formula 1 or cyclic hydrosilane oligomer represented by the following Chemical Formula 2, in the presence of water or alcohol;~~

b) cyclic siloxane represented by the following Chemical Formula 3,

~~c) a mixture of the siloxane oligomer and silane or silane oligomer represented by the following Chemical Formula 4 or Chemical Formula 5, respectively; and~~

d) a mixture of the cyclic siloxane represented by the Chemical Formula 3 and silane or silane oligomer represented by the following Chemical Formula 4 or Chemical Formula 5, respectively; and

ii) hydrolyzing and condensing the first mixture by adding water and catalyst;

~~Chemical Formula 1~~



~~wherein:~~

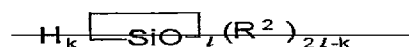
~~R⁺ is hydrogen, fluorine, aryl, vinyl, allyl, or linear or branched C₁₋₄ alkyl substituted or unsubstituted with fluorine;~~

~~m is independently an integer of 1 to 20;~~

~~n is independently an integer of 1 to 20, and~~

~~(2m-n+4) is an integer of 1 to 43;~~

~~Chemical Formula 2~~



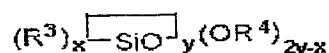
~~wherein:~~

~~R² is hydrogen, fluorine, aryl, vinyl, allyl, or linear or branched C₁₋₄ alkyl substituted or unsubstituted with fluorine;~~

~~k and l are independently an integer of 3 to 10, and~~

~~(2l-k) is an integer of 1 to 17;~~

Chemical Formula 3



wherein:

R³ is hydrogen, fluorine, aryl, vinyl, allyl, or linear or branched C₁₋₄ alkyl substituted or unsubstituted with fluorine;

R⁴ is hydrogen or linear or branched C₁₋₄ alkyl;

x and y are independently an integer of 3 to 10, and

(2y-x) is an integer of 1 to 17;

Chemical Formula 4



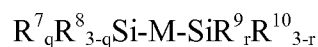
wherein:

R⁵ is hydrogen, aryl, vinyl, allyl, or linear or branched C₁₋₄ alkyl substituted or unsubstituted with fluorine;

R⁶ is acetoxy, hydroxy, or linear or branched C₁₋₄ alkoxy; and

P is independently an integer of 0 to 2;

Chemical Formula 5



wherein:

R⁷ and R⁹ are hydrogen, aryl, vinyl, allyl, or linear or branched C₁₋₄ alkyl substituted or unsubstituted with fluorine, respectively;

R⁸ and R¹⁰ are acetoxy, hydroxy, or linear or branched C₁₋₄ alkoxy, respectively;

M is C₁₋₆ alkylene or phenylene; and

q and r are independently an integer of 0 to 2.

2. and 3. (Canceled)

4. (Canceled)

5. (Canceled)

6. (Original) The method according to Claim 1, wherein the silane or silane oligomer of c) and d) comprises silicon, oxygen, carbon and hydrogen.

7. (Canceled).

8. (Original) The method according to Claim 1, wherein an amount of the catalyst is between about 0.000001 mol to about 2 mol, based on about 1 mol of the silane compound.

9. (Previously presented) The method according to Claim 1, wherein hydrolyzing and condensing the first mixture are performed at a temperature of about 15°C to about 80°C.

10. (Withdrawn) An organic silicate polymer prepared by the method of Claim 1.
11. (Withdrawn) A composition for forming an insulation film of a semiconductor device, comprising:
organic silicate polymer and organic solvent,
the organic silicate polymer being prepared by mixing silane compound with the organic solvent to prepare a first mixture and hydrolyzing and condensing the first mixture by adding water and catalyst, the silane compound being selected from a group consisting of:
i) oxidized hydrosilane;
ii) cyclic siloxane;
iii) a second mixture of oxidized hydrosilane and silane or silane oligomer;
and
iv) a third mixture of cyclic siloxane and silane or silane oligomer.
12. (Withdrawn) The composition for forming an insulation film according to Claim 11, further comprising one or more additives selected from a group consisting of organic molecules, organic polymers, organic dendrimers, pH adjuster, colloidal organic silica and surfactant.
13. (Withdrawn) A method for preparing an insulation film of a semiconductor device, comprising:
a) mixing silane compound with organic solvent to prepare a first mixture and hydrolyzing and condensing the first mixture by adding water and catalyst to obtain an organic silicate polymer, the silane compound being selected from a group consisting of:
i) oxidized hydrosilane;
ii) cyclic siloxane;
iii) a second mixture of oxidized hydrosilane and silane or silane oligomer; and
iv) a third mixture of cyclic siloxane and silane or silane oligomer;

- b) dissolving the organic silicate polymer in solvent;
- c) coating the dissolved organic silicate polymer on a substrate of a semiconductor device; and
- d) drying and hardening the coated insulation film.

14. (Withdrawn – previously presented) The method according to Claim 13, wherein coating the dissolved organic silicate polymer is performed by a spin coating, a dipping, a roll coating or a spraying.

15. (Withdrawn – previously presented) The method according to Claim 13, wherein drying the coated insulation film is carried out at a temperature of about 30°C to about 350°C, and hardening the coated insulation film is carried out at a temperature of about 350°C to about 500°C.

16. (Withdrawn) An insulation film of a semiconductor device prepared by the method of Claim 13.

17. (Withdrawn) The insulation film according to Claim 16, wherein the insulation film has a thickness of about 0.05μm to about 2μm.

18. (Withdrawn) A semiconductor device that comprises the insulation film prepared by the method of Claim 13.

19. and 20. (Canceled).

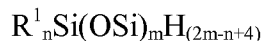
21. (New) A method for preparing organic silicate polymer, comprising:

oxidizing hydrosilane oligomer represented by the following Chemical Formula 1 or cyclic hydrosilane oligomer represented by the following Chemical Formula 2 in the presence of water or alcohol to prepare siloxane oligomer;

mixing the siloxane oligomer or a mixture of the siloxane oligomer and silane or silane oligomer represented by the following Chemical Formula 4 or Chemical Formula 5, respectively, with organic solvent to form a first mixture; and

hydrolyzing and condensing the first mixture by adding water and catalyst:

Chemical Formula 1



wherein:

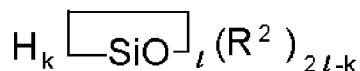
R^1 is hydrogen, fluorine, aryl, vinyl, allyl, or linear or branched C_{1-4} alkyl substituted or unsubstituted with fluorine;

m is an integer of 1 to 20;

n is an integer of 1 to 20, and

$(2m-n+4)$ is an integer of 1 to 43;

Chemical Formula 2



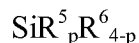
wherein:

R^2 is hydrogen, fluorine, aryl, vinyl, allyl, or linear or branched C_{1-4} alkyl substituted or unsubstituted with fluorine;

k and l are integers of 3 to 10, and

$(2l-k)$ is an integer of 1 to 17;

Chemical Formula 4



wherein:

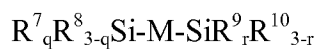
R^5 is hydrogen, aryl, vinyl, allyl, or linear or branched C_{1-4} alkyl substituted or

unsubstituted with fluorine;

R^6 is acetoxy, hydroxy, or linear or branched C_{1-4} alkoxy; and

P is an integer of 0 to 2;

Chemical Formula 5



wherein:

R^7 and R^9 are hydrogen, aryl, vinyl, allyl, or linear or branched C_{1-4} alkyl substituted or unsubstituted with fluorine, respectively;

R^8 and R^{10} are acetoxy, hydroxy, or linear or branched C_{1-4} alkoxy, respectively;

M is C_{1-6} alkylene or phenylene; and

q and r integers of 0 to 2.

22. (New) The method according to Claim 21, wherein oxidizing the hydrosilane oligomer or cyclic oligomer is carried out by adding at least one or a peroxide oxidizing agent, the catalyst being selected from the group consisting of Pd, Pt and Rh.